

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

SPECIFICATION

INVENTION: SYSTEM IN VEHICLES FOR MAKING A TELEPHONE
CALL

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TITLE OF THE INVENTION

SYSTEM IN VEHICLES FOR MAKING A TELEPHONE CALL

BACKGROUND AND SUMMARY OF THE INVENTION

5 This application claims the priority of German application 19933326.2, filed July 16, 1999, the disclosure of which is expressly incorporated by reference herein.

 The invention relates to a system in vehicles for making a telephone call.

10 During telephone calls which are made in a vehicle, only acoustic information has so far been transmitted between the conversation partners. In contrast, various video telephones already exist for the operation in the fixed network, which video telephones emit speech as well as image information.

15 Telephone conversations in the vehicle considerably tie up the driver's attention and can lead to dangerous traffic situations. One reason is that the external conversation partner does not know the actual traffic situation, which does not permit him to adapt his conversation behavior correspondingly. If the
20 conversation were to take place within the automobile the other party would not ask stressful questions because he would understand the traffic situation. However, a remote second party frequently asks the driver to make statements in stressful situations because he does not know of the stressful situation.

When using image telephony, which is known per se (compare German Patent Document DE 197 36 675 A), in a vehicle, there is the additional problem of a frequently absent transmission capacity.

5 It is therefore an object of the invention to provide a system of the initially mentioned type by means of which it is possible to transmit information important to the receiving party concerning the actual situation of a conversation partner sitting in a vehicle.

10 The driver is permitted to add the visual transmission of the traffic situation via video telephony to the telephone call connection, as a supplement to the speaking channel. If the driver's conversation partner has a video telephone, the actual traffic situation is schematically transmitted to the driver's conversation partner.

15 During the implementation of the invention, the quantity of data of the image taken by means of the image acquisition device is reduced in the vehicle.

20 The image information can be generated completely without any image acquisition device relying only on information obtained inside the vehicle by means of an already existing navigation system. This navigation system furnishes information concerning

the type of the actually driven road and the adjacent roads. On the basis of this information, a schematic image of the environment is also generated inside the vehicle by means of conventional imaging devices. Here, changing environmental influences (rain, fog, darkness) have no influence on the quality of the schematic representation of the traffic situation which takes place in the style of graphic navigation information. In a supplementary manner, information of the vehicle sensor system, such as the ranging control system (furnishes information on preceding and oncoming vehicles) and a system for the detection of surrounding vehicles, can be integrated in the representation of the traffic situation.

The actualization of the display depends on the transmission possibilities. If required, a more schematic display can be accepted in favor of a higher actualization rate.

The acoustic information of the navigation system should preferably be slightly above threshold background information for the conversation partner in order to transmit information concerning imminent turn-off operations without disturbing the telephone conversation.

The necessary transmission capacity can be provided by a second synchronized transmission channel or an increased transmission capacity of a channel which, when the vehicle is

stopped, can also be utilized for transmitting document information (writing, picture) in the sense of a teleconference.

Other objects, advantages and novel features of the present invention will become apparent from the following detailed description of the invention when considered in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 provides a schematic illustration of a traffic situation as viewed by a distant second party to a conversation; and

Figure 2 is an example of a system arrangement for providing image and audio information to a distant second party according to the present invention. Video unit and sensing system.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The traffic situation illustrated in Figure 1 is an example of a video transmission sent to a second party in order to provide the second party with a realization of the traffic situation of the caller in vehicle 1. Reference numbers 2 and 3 correspond to preceding automobiles whereas reference 4-7 represent oncoming traffic. According to the present invention,

this bird-eye view shown in Figure 1, when presented to a second party to the call at a distant location, will provide the necessary information for that second party to comprehend that the first party needs to be paying close attention to his driving situation. This schematic of the actual traffic situation allows the second party to adjust the conversation accordingly to relieve or to avoid adding to the stress of the first party in vehicle 1.

The system of Figure 2 provides an exemplary arrangement according to a preferred embodiment whereby a sensor system for surrounding vehicles (ACC) 12 includes the sensors 10 which provide object information 14 after being processed by the system 12. This onboard sensor system in vehicle 1 also includes a navigation system 20 having a map database 22 which provides a map display 24 to the video unit 16 which may be video telephone which receives information from the sensing system 12 and the navigation system 20 in order to provide a map 18 which includes surrounding vehicles. This visual map is shown, as an example, in Figure 1, as discussed above. The visual map is sent through the transmission unit 30 to the video unit 32 in the distant second party vehicle. Additionally, the navigation system may include a series of audio messages 26 in order to transmit information concerning imminent turn off operations, for example. The acoustic information from these audio message 26 is fed through the audio unit 28 at an audio level which is slightly

above the threshold background for the conversation partner. The microphone 38 establishes conversation level for the first party in vehicle 1. That is, the distant second party converses through audio unit 34 with the first party in vehicle 1 through the audio unit 28. When an audio message from the navigation system requires the driver to vehicle 1 to act immediately, the message is delivered slightly above the threshold background information of the conversation. The transmission unit 30 is a synchronized transmission channel for both the video and the audio with the audio transmission occurring both the distant second party and the first party in vehicle 1. On the other hand, video information is only transmitted from the first party to the second distant party. In order to increase transmission capacity, it is possible to utilize a second synchronized transmission channel 36 to address the audio information from the second party to the first party through the microphone 38. With this arrangement, the driver of vehicle 1 is able to add visual information concerning the traffic situation.

It is also possible, according to a second embodiment, to provide information generated without any image acquisition device by relying only on information obtained inside the vehicle by means of an already existing navigation system 20. This type of system can furnish information concerning the type of road being driven on as well as the adjacent roads and, on that basis, a schematic of the environment can also be generated inside the

vehicle and transmitted to the distant vehicle. Additionally,
the system can be supplemented with information from vehicle
sensor systems such as range and control system which detect
location of the surrounding vehicle. Such supplementary ranging
5 information can be added in addition to the navigation system or
can be integrated into the representation of the traffic
situation.

The conversation behavior of the conversation partner
becomes more cooperative because of improved information
concerning the actual traffic situation and takes into account
the requirements of the driving task by pauses or reference to
the traffic situation.

The foregoing disclosure has been set forth merely to
illustrate the invention and is not intended to be limiting.
15 Since modifications of the disclosed embodiments incorporating
the spirit and substance of the invention may occur to persons
skilled in the art, the invention should be construed to include
everything within the scope of the appended claims and
equivalents thereof.